1862 he added to his Museum duties the work of a "Docent" in the University; but eventually (1877) retired altogether from the Imperial Museum to take upon himself the duties of the University Professorship, involving the care of the University Mineral Collection: in this office he remained till the end of his life.

Much of Schrauf's published work consists in the technical examination and description of mineral species, but he also gave much thought to the general and recondite problems connected with atoms and molecules and their relation to the physical characters of crystals: his earlier speculations are incorporated in his "Treatise on Physical Mineralogy" published in 1866-68, but the later are only to be found in isolated memoirs. He was also the author of a useful handbook on "Precious Stones" (1869). Interested deeply in the philosophy of his subject, he sought the necessary mental and physical relaxation in the mechanics of crystal drawing, and undertook to prepare for publication an Atlas of the crystalline forms of all mineral species, taken in alphabetical order: but species and forms were discovered more quickly than figures could be prepared and sold, and the publication was discontinued before the letter D had been arrived at. The loss of a real thinker is a great one for any science.

## NOTES.

AMONG those who have accepted nomination as vice-presidents of the general committee of the Fourth International Congress of Zoology are the following:—Prof. R. J. Anderson, of Belfast; Prof. Bridge, of Birmingham; Prof. D. J. Cunningham, of Dublin; Prof. Herdman, F.R.S., of Liverpool; Prof. M'Intosh, F.R.S., of St. Andrews; Mr. J. Cosmo Melvill, of Manchester; Prof. Lloyd Morgan, of Bristol; Prof. Alleyne Nicholson, F.R.S., of Aberdeen; Dr. Scharff, of Dublin; Dr. Traquair, F.R.S., of Edinburgh; Canon Tristram, F.R.S., of Durham; Lieutenant-Colonel R. G. Wardlaw Ramsay; and Prof. Percival Wright, of Dublin.

MR. GEORGE SHARMAN retires at the end of this year from the post of Palæontologist to the Geological Survey of Great Britain. Entering the service just before the death of De la Beche in 1855, he served for a while under the first Director-General, and subsequently under Murchison, Ramsay, and Sir Archibald Geikie, with Mr. J. W. Salter and Mr. R. Etheridge as his senior colleagues. On the retirement of Mr. Etheridge in 1881, he was promoted, together with Mr. E. T. Newton, to take charge of the palæontological collections in the Museum of Practical Geology. Although he has published but little outside the "Memoirs of the Geological Survey," Mr. Sharman has sedulously devoted himself to the study of British fossils, and more especially the Invertebrata, his acquaintance with which is unequalled. The important aid which he has continuously given for over forty years to the field-geologists of the Survey is shown to some extent in the lists of fossils published in the official "Memoirs"; but no inconsiderable portion of his time has been given to those inquirers who so frequently come to a public museum with bags and pockets full of fossils to be identified by the officers. His skill and patience, and his readiness to give information have combined to characterise his long career as one of marked and unselfish devotion to the public service.

THE death is announced of Prof. Wilhelm Joest, known by his travels in North Africa, America and Asia.

MR. HENRY CECIL, writing from Bournemouth, under date December 24, says:—"I was fortunate enough to see, at 1.13 this morning, in the middle of the latter half of its passage, the most remarkable meteor I ever saw. At that hour the sky was perfectly clear; and looking at the brilliant stars through the western of two windows looking south, I became suddenly aware of an intense white illumination overhead, which, from the steepness of the arc, could not, I think, have had its origin far to the westward of the zenith."

IN the course of an article upon Sir W. E. Garstin's report on the work of the Irrigation Department of Egypt in 1896, the *Times* mentions as a new indication of scientific progress in Africa, that, since January 1, 1896, the water levels of the Victoria Nyanza have been daily recorded by means of gauges erected at three places, viz. Port Alice, Port Victoria, and Lubwas Usoga. The readings, as also a monthly statement showing the rise and fall of the lake, are received at Cairo; but the records of a series of years are necessary before any attempt can be made certainly to prognosticate the extent of influence that a rise or fall of the lake waters may produce on the Nile. The report states that gauges upon the Albert Nyanza are very urgently required in order to show what are the relations between the levels of that lake and the summer water supply in Egypt. This lake being nearer to the point of delivery, its levels are, if possible, more important to Egypt than are those of Lake Victoria, and the hope is expressed that the English officials at Uganda may erect gauges and furnish Egypt with records of the daily readings. Major R. H. Brown, Inspector-General of Irrigation for Lower Egypt, in his report for 1896 expresses the opinion that, as the catchment area of Lake Victoria is comparatively small, the lake may not have such an important influence on the Nile as we are accustomed to attribute to it, and that gauges at Fashoda, Khartum, and Berber are what is chiefly wanted.

WE are glad to see that a Lincolnshire Science Society has been established. For many years there has been, in Lincolnshire, an absence of combination among scientific workers. Of individual investigators there is no lack, and much valuable work has been carried on by them; but from a want of knowledge of what has been, and what is being done by others in the special subjects in which each is interested, there has been a waste of time and energy. A central, organising, directive force has been wanting; and it is to supply this want, and to give to individuals and to the local county societies an opportunity for combining forces for the purpose of centralising and directing their efforts so that their various plans of action may be harmonised, that the Lincolnshire Science Society has been called into existence. The Society consists of a number of sections, the members of each of which devote themselves to the working out of one or more lines of research in the sciences that the sections represent. The presidents of the sections form the Council of the Society, and it is a part of their duty to suggest to the members and to the affiliated societies such lines of research and such methods as will be likely to yield the best results. The Society is at present actively helping on a scheme having for its object the foundation and the endowment of a county museum. The object is a worthy one, and we trust that both it and the Society will meet with the fullest encouragement and success. Particulars referring to the Society may be obtained from the president, Dr. G. M. Lowe, the hon. sec., Mr. G. Grierson, or the vice-president, Mr. J. H. Cooke, Thorndale, Lincoln.

A FRESH contribution to our knowledge of the physiological effects of high altitudes is given by Prof. Piero Giacosa (*Rendiconti del R. Istituto Lombardo*, xvii.), who has studied more especially their influence on the exchange of material, and particularly on the elimination of nitrogen. Prof. Giacosa considers that as the altitude of 6000 metres is approached, there is an increasing risk of reaching the limit beyond which the physiological functions cannot be completed; but below 6000 metres the diminished pressure is never a direct and sufficient cause of the disorders that are observed, and its only effect is to aggravate those due to fatigue, to impaired digestion, and to other causes.

WRITING in the *Memorie della Società degli spettroscopisti Italiani*, xxvi., Dr. G. B. Rizzo publishes the details of a number of observations for determining the value of the solar constant. This value could not be determined with sufficient accuracy from experiments made at one station alone, as it was found that the results varied largely according to the formula employed; observations should therefore be taken at several stations differing considerably in altitude, but at no great horizontal distance apart. Four stations were therefore selected on Monte Rocciamelone, in the Val di Susa, at altitudes of 501, 1722, 2834 and 3537 metres, and by determining the intensity of solar radiation, referred to the zenith, at these stations, the relations between this intensity and the corresponding atmospheric pressure were expressed by means of two independent empiric formulæ. From these the author finally infers that the solar constant has a value of approximately 2·5 small calories per square centimetre per minute.

MR. R. F. ARNOTT writes to us from Sĕlángor, Straits Settlements, with reference to a note on the alleged conversion of Mexican silver dollars into gold, by Dr. Stephen H. Emmens (September 9, 1897, p. 451). He has assayed four Mexican dollars in circulation at Selángor, and found gold in appreciable quantity, as follows:—

| Number of assay. | | Marks. | | Gold. | |
|---|---|---|---|---|---|
| 1. | ... | 8 R.G.$^{\text{A}}$ 1874 I.G. | ... | 0·06 | per cent. |
| 2. | ... | 8 R.O.$^{\text{A}}$ 1892 E.N. | ... | 0·09 | ,, |
| 3. | ... | 8 R.G.$^{\text{A}}$ 1893 J.S. | ... | 0·08 | ,, |
| 4. | ... | 8 R.G.$^{\text{A}}$ 1895 M.M. | ... | 0·01 | ,, |

The dollars were taken at random from rather more than a hundred different issues, and no unusual treatment was employed during assay. The results are worth putting on record, as they suggest a possible origin of the gold in the "argentaurum" manufactured by Dr. Emmens. It is, however, well known that gold exists in Mexican dollars. Our attention has been called to the fact that in 1891 an examination of 11,846 such coins was made at the Royal Mint (see Report of the Deputy-Master of the Mint for 1891, pp. 110-113). The dollars from all the Mexican mints were found to contain gold, the average amount being 0·309 per 1000. Those from Guadalajara (Nos. 1, 3 and 4 of Mr. Arnott) numbered 463, and contained an average of 0·964 of gold per 1000. In connection with the presence of gold in silver, Mr. Arnott points out that much of the silver received at the Indian mints some years ago was rich in gold; sycee containing an average of about 0·9 per cent., and silver coins issued contained as much as 0·09 per cent. of gold.

THE attention of the commercial interests of Germany has recently been directed to the great advantage that would be derived to the trade of that country by the completion of the canal system joining the Black Sea with the North Sea, and also with the Baltic. At present all merchandise conveyed to and from the East has to go round by sea to Hamburg or Stettin, the distance by sea being more than 3000 miles as compared with about 1000 miles through Austria and Germany by a system of inland waterways. Two Congresses have recently been held —one at Passau, in Bavaria, and the other at Vienna—for the study and discussion of schemes for developing this through communication, and the Ministry of Commerce at Vienna has had inquiries made as to the feasibility of the plans proposed. These are to open out and improve the Ludwig Canal, which connects the Danube with the Main, and so with the Rhine, so as to make it available for barges carrying 500 tons, and thus completing a direct water-way between the Black and North Seas. The length of this canal is 106 miles, and it now has a depth of water of only five feet and a navigation fitted for 127-ton barges. The second part of the proposed scheme is to connect the Danube with the Elbe by a new canal from the former, near Vienna, turning in a north-west direction to join the Upper Moldau, and by the canalisation of this river to Prague, and of the Elbe to Aussen. The third scheme is to connect the Austrian and German water-ways by connecting the March, an effluent of the Danube, with the Oder, and making the system capable of taking 600-ton barges, and thus connecting the Black Sea with the Baltic. The Russian scheme, having a similar object, and described in NATURE of February 25, is to be commenced forthwith.

THE latest issue of the *Memoirs* of the Caucasian branch of the Russian Geographical Society (vol. xvii. part 1), contains the first part of a very valuable work, by A. V. Voznesensky, on the precipitation in Caucasia. The author gives first a series of tables, for 113 Caucasian stations, showing the amounts of rain and snow, and the numbers of days with rain or snow, for every month of every year during which observations were made at each station. The position of each observatory—its latitude, longitude and altitude, the elevation of the pluviometer above the ground, and general remarks are also given; and at the end of the work the results are summed up in a general table. Sixteen maps accompany the work: one of them is an orographical map of Caucasia; then come two series, of five maps each, showing by curves the geographical distribution of precipitation over the territory, *i.e.* the average amount of precipitation, and the probability of snow or rain for the whole year and for each season separately. The distribution of precipitation during the different months of the year is next represented by diagrams for thirty stations; and seven different types having thus been established, the geographical distribution of the regions belonging to each of these types is given on a map. Another map shows the more or less uniformity which exists in the distribution of precipitation during the year in various parts of Caucasia; and two more maps represent by curves the regions of summer and winter droughts, as well as the intermediate regions. The text in which the general conclusions had to be discussed has been left for a second part of the same work, the author having had to leave the Caucasus to take up the management of a meteorological station at Irkutsk.

It is thirty-five years since the late Mr. S. P. Woodward described the remarkable fossil *Barrettia* from the Cretaceous limestone of Jamaica. Though in general appearance it resembled an operculate coral, Mr. Woodward came to the conclusion that it was really an aberrant Lamellibranch of the Hippurite group. Since that time nothing has been added to our knowledge of the form; but in a recent *Bulletin* of the American Museum of Natural History, Mr. R. P. Whitfield gives the results of his study of a large series of specimens obtained from the original locality, which show certain additional details of structure. He cannot agree that *Barrettia* was a Lamellibranch, but strongly inclines to place it among the corals: it certainly is a very isolated form, as the only corals with which he is able to suggest comparisons in structure are of Palæozoic age.

"Do the crystalline gneisses represent portions of the original earth's crust?" is the question asked, and answered in the affirmative, by Mr. J. Lomas, in his recent presidential address to the Liverpool Geological Society (published in the December *Geological Magazine*). Excluding gneisses of later igneous or metamorphic origin, there remain the great series of fundamental gneisses, world-wide in distribution and uniform in general character, which must have had some world-wide cause of origin. As a possible cause of their foliation, Mr. Lomas suggests tidal action in the incompletely-consolidated crust. Prof. G. H. Darwin has shown that huge tidal wrinkles must have been raised by the moon when near the earth, forming idges and troughs which ran north and south near the Equator, and curved to the eastward as they approached the Poles. The strike of the gneisses of Britain and Scandinavia corresponds to the direction of these tidal wrinkles in those latitudes, and there is evidence that the Palæozoic strata were deposited in troughs parallel to the gneissic ridges. In Anglesey, according to Mr. Lomas, we have a portion of one such ridge that may never have been submerged under the sea.

THE Cambridge University Press has just published a volume of "Solutions of the Exercises in Taylor's Euclid" (Pitt Press Mathematical Series), Books VI.-XI.

MR. H. TRIMBLE reprints, from the *American Journal of Pharmacy*, a series of papers by himself and the late Prof. E. S. Bastin, on "Some North American Coniferæ." Some of the more important American species from an economical point of view are described in detail, special attention being given to the microscopical structure of the leaf and stem and to the chemical composition of the wood. Excellent photographs are given to show the habit of each species, and woodcuts of microscopic sections.

A SECOND edition of Mr. Arthur Mee's "Observational Astronomy," greatly enlarged and improved, has just been published by the office of the *Western Mail*, Cardiff. The new edition is, in point of illustration, vastly superior to the original work, some of the half-tone blocks being very fine reproductions; the text also has been through the refining fire. The volume should be in the possession of every amateur astronomer, however limited his instrumental equipment may be; for it will bring him right into the current of astronomical thought, and inspire him to make the best use of his opportunities.

VOL. VIII., part 1, of the *Proceedings* of the Liverpool Geological Society contains a valuable series of papers. These include the presidential address on "Glacial Geology," and a paper on "Ayrshire Geology," by Mr. Mellard Reade; detailed and illustrated accounts of the "Carboniferous Limestone of the Clwyd Valley," by Mr. G. H. Morton; of the "Igneous Rocks of Aran Mowddwy," by Mr. T. H. Cope; and of the "Varanger Fjord," by Messrs. Dickson and Holland. Mr. Lomas investigates the earthquake of December 17, 1896, and traces the isoseismal lines; and Dr. Callaway criticises the chemical evidence for the existence of organisms in Archæan times, finding it quite fallacious.

THE Thornton-Pickard Manufacturing Company, Ltd., have sent us a copy of their new illustrated catalogue for 1898. Several very fine half-tone reproductions of photographs illustrate the catalogue, and testify to the excellence of results obtained with cameras and instantaneous shutters manufactured by the firm. Among the apparatus which call for special mention are a new 5 × 4 size of the Amber camera, a new patent film carrier, and a new aluminium shutter. The firm offers 200*l.* in prizes for the best results obtained with their cameras and shutters. Full particulars of this competition, as well as many serviceable hints to photographers, will be found in the catalogue, a copy of which will be forwarded on application.

WE have received the yearly report of the Russian Geographical Society for the year 1896, and it is full of interest. It contains, as usual, the obituaries of the members whom the Society lost during the year, condensed reports of the expeditions of the Society, a review of its publications, and excellent accounts of the work done by those geographers to whom medals were awarded by the Society in 1896. Very valuable feature of this year's reports are the yearly reports of the Siberian branch of the Society (Irkutsk) and of the Amur branch (Khabarovsk) for the years 1894 and 1895, as also of the Society for the Study of the Amur Region for the year 1895. Unfortunately, one does not find in the report any information concerning the extremely interesting but almost quite unknown activity of the West Siberian branch of the Russian Geographical Society.

A SECOND edition of Prof. J. J. Thomson's "Elements of the Mathematical Theory of Electricity and Magnetism" has just been published by the Cambridge University Press. The first edition, published in 1895, was reviewed in NATURE (vol. liv. p. 97), and as few alterations have been made, we need do no more than announce the appearance of the new edition, and express pleasure that the work is finding its way into the hands of an increasing number of students.—Prof. J. A. Ewing's work on "The Steam Engine and other Heat Engines" (Cambridge University Press), reviewed in NATURE three years ago (vol. li. p. 219), has also reached a second edition. A considerable amount of new matter has been added to the volume, and the section relating to gas engines has been much extended. To the thoughtful student of engineering science the book is invaluable. —Part 2 of "An Illustrated Manual of British Birds," by Mr. Howard Saunders, has been published by Messrs. Gurney and Jackson. The work will be completed in twenty parts, and will contain illustrations of nearly every species.

THE annual report on the work of the Institute of Jamaica has been received. The Science Section of the Institute appears to have been particularly active in the period covered by the report. A number of changes have been made in the systematic arrangement of the objects in the museum. In the zoological collection a 4 to 6 per cent. solution of formalin has been mostly employed as a preservative fluid and found to work very satisfactorily, though the colours of the objects were not retained for long in specimens exposed to strong light. For delicate objects, such as jellyfish and sea-anemones, it is found to be extremely serviceable, preserving perfectly the natural form and histology. Research work, mainly upon the Actinaria of the island, has been continued in the Biological Laboratory of the Institute. A paper on the Jamaica Zoanthidæ, embracing a description of ten species, has been prepared by the curator for publication; also one on the Actinian family Aliciidæ, describing, amongst others, a new Jamaica species of Bunodeopsis. During the summer months three students from the Johns Hopkins University, under the direction of Prof. Brooks, established a temporary marine laboratory at Port Henderson. Contributions to Jamaican zoology have been made by them, and many specimens were presented to the museum. Investigations of Indian remains have been continued from last year, and more valuable material collected from the caves and refuse-heaps. The objects, however, do not differ greatly in type from those referred to in the last report. An account of the results, illustrated with numerous figures, plates, and a map, will shortly be published in the *Journal* of the Institute. The report thus shows that the Institute is actively assisting in the advancement of knowledge, as well as working in various ways to create and stimulate interest in scientific objects and study.

IN the current number of the *Berichte*, P. Walden describes the very remarkable effect produced by the addition of a uranyl salt to a solution of an optically active substance. When a substance such as *l*-malic acid is dissolved in water along with one molecule of uranyl nitrate and about four molecules of caustic potash, the rotation produced by the solution is more than five hundred times as great as that of the acid alone, whilst it remains of the same sign. Similar, but less intense effects are observed with other optically active hydroxy-acids and their ethereal salts, but no increase is produced with optically active substances, such as chlorosuccinic acid, which do not contain a hydroxyl group, and indeed a slight diminution is caused in some of these cases. Optically inactive acids, such as mesotartaric acid, inactive malic acid, &c., are quite unaffected by the addition of these substances. Apart from its high theoretical interest, the phenomenon provides a ready method of distinguishing active substances of low rotatory power from their inactive isomerides.

THE additions to the Zoological Society's Gardens during the past week include a Chacma Baboon (*Cynocephalus porcarius*, ♂), a Black-backed Jackal (*Canis mesomelas*, ♀) from South Africa, presented by Major Haynes Sadler; a Red-bellied Wallaby (*Macropus billardieri*) from Tasmania, presented by Mrs. Beaumont; a Guillemot (*Lomvia troile*), British, presented by Mr. John Pettitt; a Yellow-cheeked Lemur (*Lemur xanthomystax*) from Madagascar, a Marsh Harrier (*Circus æruginosus*), European, deposited; six Summer Ducks (*Æx sponsa*, 5 ♂, 1 ♀), purchased.

## OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JANUARY:—

| January | h. m. | | h. m. | |
|---|---|---|---|---|
| 2. | | | | Meteoric shower from Quadrans (230° + 52°). |
| 3. | 6 59 | to | 8 16. | Occultation of 16 Tauri (mag. 6·5). |
| 3. | 7 13 | ,, | 8 27. | ,, 17 ,, 3·8). |
| 3. | 8 2 | ,, | 9 11. | ,, 23 ,, 4·2). |
| 3. | 8 46 | ,, | 10 8. | ,, η ,, 3·0). |
| 3. | 9 55 | ,, | 11 11. | ,, 28 ,, 6·2). |
| 3. | 10 1 | ,, | 10 59. | ,, 27 ,, 3·8). |
| 5. | | | | Uranus 52′ S. of β Scorpii. |
| 5. | 12 56 | to | 13 58. | Occultation of 125 ,, 4·9) |
| 7. | 10 57 | ,, | 12 32. | Partial eclipse of the moon. Magnitude 0·157 at 11h. 45m. |
| 9. | 8 11 | ,, | 9 8. | Occultation of o′ Cancri (mag. 5·2). |
| 10. | 15 53 | ,, | 17 4. | Occultation of B.A.C. 3398 (mag. 6·0). |
| 14. | 5 | | | Jupiter in conjunction with moon. ♃ 7° 5′ N. |
| 17. | 16 30 | to | 17 31. | Occultation of B.A.C. 5314 (mag. 5·4). |
| 17. | 18 51 | ,, | 20 1. | ,, ,, 5347 ,, 5·8). |
| 18. | 7 | | | Saturn in conjunction with moon. ♄ 5° 40′ N. |
| 18. | 12 53 | to | 15 25. | Transit of Jupiter's Satellite III. |
| 20. | 8 31. | | | Minimum of β Persei (Algol). |
| 21. | | | | Total eclipse of the sun invisible at Greenwich. Begins on the earth generally 16h. 46m., ends 21h. 53m. |
| 23. | 5 20. | | | Minimum of β Persei (Algol). |
| 25. | 11 56 | to | 14 52. | Transit of shadow Jupiter's Sat. III. |
| 25. | 16 37 | ,, | 19 6. | ,, Jupiter's Sat. III. |
| 29. | 4. | | | Mercury at greatest elongation (25° 4′ W.) |

"NAUTICAL ALMANAC" CORRIGENDA.—In a letter to the *Journal* of the British Astronomical Association, Dr. A. M. W. Downing forcibly impresses upon astronomers the necessity and importance of consulting the page of *errata* in each issue of the *Nautical Almanac*. In consequence of the *Nautical Almanac* going to press four years in advance, any corrections to data influencing the tables gives, of course, slightly modified results. We read, for instance, that "in the first edition of the *Nautical Almanac* for 1898 (issued in December 1894) the data are affected by an error which throws out the times of the lunar eclipses to a considerable extent; in the second edition (issued last April), and in a subsequent edition, now being struck off, this error has been corrected. The correct data are also given amongst the *errata* on page xiii of the *Nautical Almanac* 1899. It will therefore be advisable for those interested in these phenomena, should they happen to possess the first edition of the *Nautical Almanac* for 1898, to correct the data for lunar eclipses in that edition by the *errata* given in the *Nautical Almanac* for 1899."

Another correction in the same edition is the position of 16 Tauri in the Pleiades, which makes an occultation of this star on January 3 a near approach only.

OCCULTATION OF THE PLEIADES.—For the third time in less than half a year the Pleiades will suffer occultation by the moon on January 3. As in the case of the occultation which took place last October, all the brighter stars will be occulted with the exception of 16 Tauri (see note on "*Nautical Almanac* Corrigenda"), and this star, although approaching very near, is just missed. The most interesting occultation will be that of Alcyone (mag. 3·0), the brightest star in the Pleiades, and its disappearance at the dark limb should be seen with the smallest telescope. The times are as follow:—

Time of disappearance, January 3d. 8h. 46m. G.M.T.
,, reappearance ,, 10h. 8m. ,,

The Iris Gulf will be in the neighbourhood of the terminator where the star disappears.

The passage of the moon before the Pleiades, although a beautiful phenomenon at any time, in this case loses some of its charm through the brightness of the moon, her age being nearly 11 days, and consequently the aërial reflection will overpower the fainter stars of this group.

PARTIAL ECLIPSE OF THE MOON.—That the moon is getting into position for eclipsing the sun on January 22 is announced by the fact that she herself is under partial eclipse at the preceding lunation on January 7. The phenomenon commences a little before midnight, and ends an hour and a half after.

The eclipse is a very small one, its magnitude being only 0·157 (moon's diameter = 1).

The following are the corrected phases as given in the *Nautical Almanac* (1898) (see note on "*Nautical Almanac* Corrigenda.")

| | | d. | h. | m. | |
|---|---|---|---|---|---|
| First contact with the penumbra, | January | 7 | 10 | 1·2 | p.m. |
| ,, ,, ,, shadow | ,, | | 11 | 47·4 | ,, |
| Middle of eclipse | ,, | 8 | 0 | 34·9 | a.m. |
| Last contact with the shadow | ,, | | 1 | 22·4 | ,, |
| ,, ,, ,, penumbra | ,, | | 3 | 8·6 | ,, |

NEW INVESTIGATIONS OF β LYRÆ.—Prof. A. Belopolsky has recently completed a new series of photographs in connection with the spectrum variations of β Lyræ; and his paper on "New investigations of the spectrum of β Lyræ" appears in the *Astrophysical Journal*, November 1897. In all, twenty-six photographs have been taken corresponding to all the phases of brightness, and the results are especially interesting since an "iron comparison" has enabled him to determine the velocity of the system with respect to the sun, and also the radial velocities at different parts of the orbit.

The dark line at λ 4482 has been utilised in making all the measures, for this line changes but little in appearance, whilst the lines λ 4471, $H_\beta$ and $H_\gamma$ undergo great variations.

From measures made of the above line, with the iron comparison as datum lines, he finds that the proper motion of the system = −2·00 geographical miles, and the maximum radial velocity is about 25 geographical miles. Moreover, the curve of radial velocities shows that the changes of brightness may be sufficiently well explained by an *eclipse;* for the times of radial velocity = 0 are very close to the times of principal and secondary minima. His description of the cyclical changes which take place in the appearances of the lines at λλ 4471 and 4482, and the reappearance of certain additional lines at particular phases agrees remarkably well with the Kensington results, which, it may be remembered, showed that of the components producing the dark lines, one was like Bellatrix, and the other gave a spectrum similar to that of Rigel.

THE ATMOSPHERES OF PLANETS.—Dr. Johnstone Stoney's name has long been connected with an important theorem in molecular physics, which may be thus stated. The atmosphere round any planet will extend to a height determined by the force of gravity on that planet, and if the speed with which the molecules move in that atmosphere exceed a critical velocity, they will escape from the planet and move independently in space. In the *Transactions* of the Royal Dublin Society, November 1897, Dr. Stoney has given in some detail his full views on this subject, and substituted better numerical results for those originally given in scattered scientific papers, by basing them on the fact that helium, whose density is twice that of hydrogen, can, and does, escape from the earth. It is contended that helium is continually being supplied to the earth's atmosphere from hot springs, that it exhibits no tendency to combine with other elements, and since no trace of it can be found in the atmosphere, it escapes above, as rapidly as it enters below. Water vapour, on the other hand, remains on the earth, and consequently limits of speed can be assigned between which